

REMARKS

Claims 1-11 are all the claims pending in the application.

I. Drawings

The Examiner objected to the drawings under 37 CFR §1.83(a), stating that “the drive unit casing side fins extending toward the heat sink and contacting the heat sink side fins in a state of low thermal conduction (claim 6)” are not shown in the drawings.

The Applicant believes that the referenced claim is shown in the drawings, and refers the Examiner to Figure 11, reference numeral 22, which shows the cited drive unit casing side fins that extend toward the heat sink 53 and contact the heat sink side fins 56. The drive unit casing side fins 22 extend toward the heat sink from the drive unit casing 2. Therefore, the Applicant believes the specific features cited in claim 6 are shown in the drawings. The Applicant respectfully requests that the objection to the drawings be withdrawn.

II. Claim Objections

The Examiner objected to Claim 11, stating that the phrase “...the drive-unit-casing side fins...” lacks proper antecedent basis.

The Applicant hereby amends Claim 11 to depend from Claim 6 instead of Claim 3. As Claim 6 properly introduces the term “drive-unit-casing side fins,” the Applicant believes that the use of the term in Claim 11 has proper antecedent basis. Therefore, the Applicant requests

that the objection to Claim 11 be withdrawn.

III. Claim Rejections—35 USC §112

The Examiner rejected Claims 1 and 6-10 under 35 USC §112, 2nd paragraph.

Specifically, the Examiner stated that the term “low thermal conduction,” as used in the last two lines of claim 1, is a relative term which renders the claim indefinite. The Examiner further states that “the specification does not provide a standard for ascertaining the requisite degree...nor does the spec. offer an example of what would constitute ‘low’ thermal conduction.”

The Applicant respectfully disagrees, and refers the Examiner to paragraph [0044] of the present published application, US 2005/0253465 A1 (hereafter “the application”). The application states “...the heat-sink side fins 56 and the drive unit casing 2 contact with each other in a state of low thermal conduction.” Paragraph [0044], line 6-7. The application then further states “...such contact in a state of low thermal conduction is realized by rounding tip ends of the fins 56 so that the fins come into substantially line contact with the drive unit casing 2 to thereby increase the contact portions in resistance of heat conduction.” Paragraph [0044], line 8-12. The application therefore defines the term “low thermal conduction” to mean, in one embodiment, the state that is realized by the line contact of the heat-sink side fins 56 and drive unit casing 2. The term is not relative or indefinite, as it has a specific meaning directed to the type of contact between the heat-sink side fins and the drive unit casing. The Applicant believes that this reference in the application defines the term “low thermal conduction” sufficient to overcome the

35 USC §112, second paragraph, rejection, and respectfully requests that the rejection be withdrawn.

The Examiner further rejected claim 7 under 35 USC §112, second paragraph, as having an insufficient antecedent basis for the term “the separation means” in line 2. The Examiner stated that for examination purposes, claim 7 was treated as if to depend upon claim 2, and claim 10 was treated as if to depend upon claim 6.

The Applicant thanks the Examiner for pointing out the antecedent basis problems and submits the following claim amendments to overcome the 35 USC §112, second paragraph rejections. The Applicant reviewed the cited claim 7 and hereby amends claim 6 to depend upon claim 2 instead of claim 1. Claim 2 properly defines “separation means (6) for preventing thermal conduction is provided in the space....” Therefore, as claim 7 depends on claim 6, and claim 6 depends from claim 2, the Applicant believes that the use of the term “the separation means” in claim 7 now has a proper antecedent basis. Additionally, as claim 10 depends from claim 7, which depends from claim 6, the Applicant also believes that claim 10 is in allowable condition as well. Therefore, the Applicant believes the aforementioned amendments overcome the 35 USC §112, second paragraph rejections.

IV. Claim Rejections—35 USC §103

The Examiner rejected Claims 1, 6, and 8-10 under 35 USC §103(a) as being unpatentable over Suzuki et al. (US 2001/0014029) in view of Bacumel et al. (US 6,198,183) in view of Becker et al. (US 6,039,114).

Claim 1

The Examiner states that Suzuki discloses most of the elements of claim 1, but does not explicitly teach that the casing is a drive unit casing accommodating an electric motor, nor does it teach that the fins and casing are in a state of low thermal conduction. The Examiner then states that “Bacumel teaches a drive unit having a drive unit casing (Fig. 2, #23) accommodating therein an electric motor (Fig. 2, #2); and Becker teaches heat-sink fins (Fig. 3a, #5) that taper into a connection point to form a cooling channel (Fig. 3a, #6). The Examiner then states that it would be obvious to one of ordinary skill in the art at the time of the invention to modify the electric motor and drive unit of Suzuki as taught by Bacumel to achieve the drive unit casing of the present invention, and that it would be obvious to modify the heat-sink fins of Suzuki in view of the tapered cross section taught by Becker to provide a means for further improving heat dissipation.

The Applicant respectfully disagrees. The Applicant has further amended claim 1 to specifically state, in element 7, “the heat-sink side fins and the drive unit casing contact with each other in a state of low thermal conduction, wherein the low thermal conduction is the line contact for the heat-sink side fins and drive unit casing.” The present invention discloses heat-sink fins that form a line contact to the drive unit casing, while the Becker references teaches a

cone-shaped lug that is tapered to a point. The line contact provided in the present invention is a notably different feature than the cone-shaped lugs of the Becker reference, and the properties of low thermal conduction and the flow passage created by the present invention are markedly different. Furthermore, the invention of Becker is directed toward contacting largely the heat-conducting lugs and cooling medium, and not for low thermal conduction, as the present invention provides. Neither Suzuki nor Becker provide any teaching, suggestion, or motivation for fins shaped in a line contact as in the present invention, and the unique low thermal conduction achieved by this configuration is not discussed in either cited reference. Therefore, the Applicant believes that claim 1 is allowable over the prior art, as neither Suzuki nor Becker provide the needed teaching, suggestion, or motivation to create a fin orientation in line contact.

Claim 2

The Examiner rejected claim 2 under 35 USC 103(a) as being unpatentable over Hara et al. (US 6,323,613) in view of Renier et al. (US 6,236,566). The Examiner stated that Hara teaches the drive unit with the elements of claim 2, but fails to teach that the heat sink fins and the drive unit casing are directly contacting the separation means. The Examiner then states that Renier does teach that the heat sink fins directly contact a separation means. The Examiner then concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the fins and separation means of Hara in view of the direct contact as taught by Renier.

The Applicant respectfully disagrees, and believes that Regnier does not provide a teaching, suggestion, or motivation to provide a separation means that directly contacts the heat sink fins and prevents thermal conduction, as does the aspect of the present invention in claim 2. Specifically, Regnier discloses in Col. 4, lines 5-11, that the insert prevents unwanted flow of water around the fins, so as to maximize the effect of the heat-exchange fluid. The insert is therefore not directed to preventing thermal conduction, unlike claim 2 of the present invention, which states, in relevant part, "...separation means (6) for preventing thermal conduction"

Furthermore, Regnier states that the "insert 46 is made from foam or silicone," which will not prevent thermal conduction. See Regnier, Col. 4, line 5. To further distinguish the present application from the prior art, the Applicant has amended claim 2 to incorporate the limitation of claim 3, wherein "the separation means comprises a low thermal conductive member (61)." In Regnier, the insert is positioned between two identical power modules, which are not required to control heat conduction. Consequentially, a low thermal conductive member (61), as stated in claim 2, is also not required or suggested in Regnier.

In contrast to Regnier, the present invention is attempting to control heat conduction to a low heat-resistant inverter from a highly heat-resistant electric motor. Therefore, the combination of Hara and Regnier do not provide the teaching, suggestion, or motivation for a separation means for preventing thermal conduction, as claimed in claim 2. Additionally, the combination of Hara and Regnier fail to teach a separation means as a low thermal conductive

member. As the Applicant believes that claim 2 is allowable over the prior art, the Applicant respectfully requests that the rejection of claim 2 be withdrawn.

Claim 3

The applicant hereby cancels claim 3 and incorporates the limitations of this claim into independent claim 2.

Claim 5

The Applicant refers the Examiner to the comments above regarding claim 2. As the Applicant believes that claim 2 is allowable over the prior art, and as claim 5 depends upon claim 2, the Applicant believes that claim 5 is also allowable. Therefore, the Applicant respectfully requests that the Examiner withdraw the rejection of claim 5.

Claim 7

With regard to claim 7, the Applicant again refers the Examiner to the arguments presented above for claim 2. As claim 7 depends on claim 6, which depends on claim 2, the Applicant believes that claim 7 is allowable, and respectfully requests that the rejection of claim 7 be withdrawn.

Claims 6, 8, and 9

The Applicant herein amends claims 6, 8, and 9 to depend from claim 2 instead of claim 1. With regard to claims 6, 8, and 9, the Applicant refers the Examiner to the arguments presented above with regard to claim 2. As the Applicant believes that claim 2 is allowable over

the prior art, and as claims 6, 8 and 9 depends from claim 2, the Applicant believes that claims 6, 8, and 9 are also in allowable condition.

Claim 10

With regard to claim 10, the Applicant again refers the Examiner to the arguments presented above for claim 2. As claim 10 depends on claim 7, which depends on claim 6, which depends on claim 2, the applicant believes that claim 10 is allowable, and respectfully requests that the rejection of claim 10 be withdrawn.

Claim 11

With regard to claim 11, the Applicant again refers the Examiner to the arguments presented above for claim 2. As claim 11 has been amended to now depend on claim 6, which depends on claim 2, the applicant believes that claim 11 is allowable, and respectfully requests that the rejection of claim 11 be withdrawn. Additionally, the Examiner states that Hara in view of Regnier teaches the drive unit of claim 3, and “Hara teaches that the low thermal conductive means is shaped to follow contact portions of the heat-sink side fins and drive-unit-casing side fins (as seen in Fig. 9).” However, the Applicant does not believe that Figure 9 of Hara shows this particular element, and requests that the Examiner more particularly point out the reference numbers in Figure 9 and the corresponding citation in the specification of Hara that disclose this element.

AMENDMENT UNDER 37 C.F.R. § 1.111
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V. Allowable Subject Matter

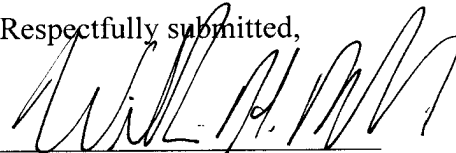
The Applicant thanks the Examiner for the indication of the allowable subject matter of claim 4, if rewritten into independent form to include all the limitations of the base claim 2. The Applicant has therefore rewritten claim 4 into independent form to incorporate the limitations of the base claim 2.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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